

For official use

Technical Report Series

**DISTRICT GROUNDWATER BROCHURE
SALEM DISTRICT, TAMIL NADU**

**A.Subburaj
Scientist-D**

**Government of India
Ministry of Water Resources
Central Ground Water Board
South Eastern Coastal Region
Chennai
December 2008**

DISTRICT AT A GLANCE (SALEM DISTRICT)

S.NO	ITEMS	STATISTICS	
1.	GENERAL INFORMATION		
	i. Geographical area (Sq. Km)	5205.29	
	ii. Administrative Divisions AS on (31-3-2007)		
	Number of Tehsils	09	
	Number of Blocks	20	
	Number of Panchayats	376	
	Number of Villages	631	
	iii. Population (As on 2001 Censes)		
	Total Population	3016346	
	Male Population	1563633	
	Female Population	1452713	
	iv. Average Annual Rainfall (mm)	600 – 1600 (1901 - 2001)	
2.	GEOMORPHOLOGY		
	i. Major physiographic Units	Upland plateau region bounded by Eastern Ghats with many hill ranges, hillocks and undulating plain slopping towards east.	
	ii. Major Drainages	Cauvery, Tirumanimuthar, Sarabanga, Vasishta, Suvedha and Ponnaiyar.	
3.	LAND USE (Sq. Km)		
	i. Forest area	1257	
	ii. Net area sown	2174	
	iii. Cultivable waste	65	
4.	MAJOR SOIL TYPES	Red soil, black soil, Brown soil, Alluvial soil & mixed soil.	
5.	AREA UNDER PRINCIPAL CROPS IN Ha. (AS ON 31.3.2007)		
		1. Paddy	37328 (15%)
		2. Groundnut	32202 (12%)
		3. Fodder	27700 (11%)
		4. Sugarcane	10468 (4%)
6.	IRIGATION BY DIFFERENT SOURCES	Number	Area irrigated (Ha)
	i. Dug wells	111521	86335
	ii. Tube wells/ Bore wells	9504	7830
	iii. Tanks/Ponds	546	1708
	iv. Canals	78	2100
	v. Other Sources	NA	NA
	vi. Net irrigated area (Ha)	97973	
	vii. Cross irrigated area (Ha)	119680	

7.	NUMBERS OF GROUND WATER MONITORING STATIONWELLS OF CGWB (AS ON 2007)		
	i. No of dug wells	18	
	ii. No of piezometers	15	
8.	PREDOMINANT GEOLOGICAL FORMATIONS	Alluvium, Colluvium, Laterite, Granite, Dolerite, Quartzite, Charnockite and Granite Gneiss.	
9.	HYDROGEOLOGY		
	i. Major water bearing formations	Colluvial deposits and weathered & fractured Granites Charnockite & Granite Gneiss.	
	ii. Pre- monsoon depth to water level (May 2006)	0.10 – 11.46 m bgl	
	iii. Pre- monsoon depth to water level (Jan 2007)	0.10 - 17.15 m bgl	
	iv. Long term water level trend in 10 years (1997-2006) in m/yr	Rise (m/year)	Fall (m/year)
		Min.-0.0155	Min.-0.0020
		Max.-0.1566	Max.-0.7940
10.	GROUND WATER EXPLORATION BY CGWB (As on 31-03-2007)		
	i. Number of Exploratory wells drilled	18	
	ii. Number of Observation wells drilled	09	
	iii. Number of Piezometers drilled under H.P.	24	
	iv. Depth range (m)	70.00 – 300.00	
	v. Discharge (Litres per second)	0.166 – 14.00	
	vi. Specific capacity (Lpm/m)	4.47 – 158.40	
	vii. Transmissivity (m ² /day)	1.00 – 265.50	
11.	GROUND WATER QUALITY		
	i. Presence of chemical constituents more than permissible limit	NO ₃ , F & SO ₄	
	ii. Type of water	NaCl, MgCl ₂ & mixed type	
12.	DYNAMIC GROUND WATER RESOURCES (2004) in M.Cu.m		
	i. Annual Replenishable Ground Water Resources	769.62	
	ii. Net Annul Ground Water Draft	1268.26	
	iii. Projected demand for Domestic and Industrial Uses up to 2025	40.07	
	iv. Stage of Ground Water Development	135.24	

13.	AWARENESS AND TRAINING ACTIVITY		
	i. Mass Awareness Programmes Organized		
	Year	1999 - 2000	2006 - 2007
	Place	Sankari	Gangavalli
	No of Participants	350	500
	ii. Water Management Training Organized		
	Year	Nil	2006 - 2007
	Place	Nil	Attur
	No of Participants	Nil	40
14.	EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING		
	i. Projects completed by CGWB		01
	Number of structures		41
	Amount spent		Rs.223.15 lakh
	ii. Projects under technical guidance of CGWB		Nil
	Number of structures		
15.	GROUND WATER CONTROL AND REGULATION		
	i. Number of OE Blocks		14
	ii. Number of Critical Blocks		01
	iii. Number of Blocks Notified		03
16.	MAJOR GROUND WATER PROBLEMS AND ISSUS	1) High level of ground water development. 2) Declining of ground water level and drying of shallow wells. 3) Incidence of fluoride in ground water. 4) Local pollution of Surface and ground water by industrial units. (Sago Industrial Pollution)	

1.0 INTRODUCTION

1.1 Administrative Details

Salem district is having administrative divisions of 9 taluks, 20 blocks, 376 Panchayats and 631 Revenue villages as detailed below:

Administrative Set-up of Salem District					
S.No.	Taluk	Area (Sq.km)	No. of Villages	Block	No. of Villages
1	Salem	672.42	177	Salem	39
				Veerapandi	53
				Panamarathupatti	34
				Ayothipattinam	51
2	Valappadi	307.50	39	Valappadi	39
3	Attur	1278.85	75	Attur	28
				Peddanayakanpalayam	47
4	Gangavalli	403.06	68	Thalaivasal	41
				Gangavalli	27
5	Sankari	398.88	48	Sankari	34
				Magudanchavadi	14
6	Idapadi	320.30	24	Idapadi	14
				Konganapuram	10
7	Mettur	777.15	46	Kolathur	12
				Mecheri	20
				Nangavalli	14
8	Omalur	666.46	87	Omalur	47
				Tharamangalam	18
				Kadayampatti	22
				Yercaud	67
9	Yercaud	382.67	67	Yercaud	67
Total		5207.29	631		631

1.2 Basin and sub-basin

The district is a part of Cauvery and Ponnaiar river basins and Sarabanga, Tirumanimuttar, Vasista and Suveda are the important watersheds/sub basins.

1.3 Drainage

Salem district is drained by tributaries of Cauvery and Vellar rivers. Cauvery river, which is perennial in nature, flows along the western and southern boundaries of the district. Sarabanga and Tirumanimuttar are important tributaries of Cauvery river and originate in the Shevroy hills. The Swetha and Vasishta rivers are tributaries of Vellar river. The Swetha river originates in the Kollimalai and flows eastwards and joins the Vellar river. The Vasishta river originates in the chitteri hills and flows southwards and joins the Vellar river. In general, the district is characterized by dentritic drainage.

1.4 Irrigation practices

The nine - fold land use classification for the district is given below (2005 - 2006)

S.No	Classification	Area (Ha)
1	Forests	125682
2	Barren & Uncultivable Lands	57383
3	Land put to non agricultural uses	39098
4	Cultivable Waste	4206
5	Permanent Pastures & other grazing lands	3165
6	Groves not included in the area sown	4809
7	Current Fallows	54140
8	Other Fallow Lands	40538
9	Net Area sown	191509
	Total	520530

(Source: Department of Economics & Statistics, Govt. of Tamil Nadu)

The block wise and source wise net area irrigated in Ha is given below (2005-06).

S.No	Block	Net area irrigated by					Total Net Area irrigated
		Canals	Tanks	Bore wells	Ordinary wells	Other Sources	
1	Attur	0.00	180	250	11340	0.00	11770
2	Ayothipattinam	0.00	0.00	710	4419	0.00	5129
3	Edapadi	1495	61	1008	2354	0.00	4918
4	Gangavalli	200	30	113	10402	0.00	10745
5	Kadayampatti	0.00	144	775	4172	0.00	5091
6	Kolathur	0.00	0.00	435	3106	0.00	3541
7	Konganapuram	0.00	161	314	1010	0.00	1485
8	Magudanchavadi	0.00	0.00	250	1472	0.00	1722
9	Mecheri	0.00	0.00	116	1042	0.00	1158
10	Nangavalli	0.00	0.00	196	1755	0.00	1951
11	Omaller	0.00	0.00	696	2613	0.00	3309
12	P.N.Palayam	0.00	0.00	160	9742	0.00	9902
13	Panamarathupatti	0.00	0.00	37	2117	0.00	2154
14	Salem	0.00	0.00	244	1552	0.00	1796
15	Sankari	405	0.00	1388	5122	0.00	6915
16	Thalaiwasal	0.00	1132	243	14362	0.00	15737
17	Tharamangalam	0.00	0.00	98	1838	0.00	1936
18	Valapadi	0.00	0.00	727	4818	0.00	5545
19	Veerapandi	0.00	0.00	70	3099	0.00	3169
20	Yercaud	0.00	0.00	0.00	0.00	0.00	0.00
	Total	2100	1708	7830	86335	0.00	97973

(Source: Department of Economics & Statistics, Govt. of Tamil Nadu)

A perusal of the table shows that about 20% (97973 Ha) of the total area of the district under irrigated agriculture. Dug wells are the major source of water for irrigation in the district, accounting for about 88% of the total area irrigated in the district.

1.5 Studies/Activities carried out by CGWB

Central Ground Water Board has completed Systematic Hydrogeological Surveys in 1981-83. Ground Water Management studies have been carried out in 1990-92, 2001-03. Geophysical investigations for assessing the geo-electric characteristics of sub-surface litho-units have also been done by Central Ground Water Board for selection and pinpointing of sites for exploratory drilling.

Central Ground Water Board took up ground water exploration for delineation of aquifers and for assessing their yield characteristics by drilling of exploratory wells during 1990-91. In the year 2004-05, Central Ground Water Board constructed 9 exploratory wells for drought mitigation through out-sourcing.

CGWB is monitoring the groundwater regime for the changes in water level and water quality through 18 dug wells and 15 piezometers. The monitoring of water levels are carried out during May (Pre monsoon), August (Middle of south west monsoon), November (post south west monsoon & initial stage of north east monsoon) & January (Post North east monsoon) to study the impact of rainfall on groundwater regime. Water samples are collected during May for determining the changes in chemical quality of groundwater.

2.0 RAINFALL AND CLIMATE

The district receives the rain under the influence of both southwest and northeast monsoons. The northeast monsoon chiefly contributes to the rainfall in the district.

Rainfall data from six stations over the period 1901-2003 were utilized and a perusal of the analysis shows that the normal annual rainfall over the district varies from about 800 mm to 1600 mm. It is the minimum around Sankari (800 mm) in the southwestern part of the district. It gradually increases towards north, northeast and east and attains a maximum around Yercaud (1594.3 mm) in the northern part.

The district enjoys a tropical climate. The weather is pleasant during the period from November to January. Mornings in general are more humid than the afternoons, with the humidity exceeding 75% on an average. In the period June to November the afternoon humidity exceeds 60% on an average. In the rest of the year the afternoons are drier, the summer afternoons being the driest.

The hot weather begins early in March, the highest temperature being reached in April and May. Weather cools down progressively from about the middle of June and by December, the mean daily maximum temperature drops to 30.2°C, while the mean daily minimum drops to 19.2°C and 19.6°C in January in Salem and Mettur Dam respectively.

3.0 GEOMORPHOLOGY AND SOIL TYPES

3.1 Geomorphology

Salem district forms part of the upland plateau region of Tamil Nadu with many hill ranges, hillocks and undulating terrain with a gentle slope towards east.

The prominent geomorphic units identified in the district through interpretation of Satellite imagery are 1) Plateau, 2) Structural hills, 3) Bazada zone, 3) Valley fill, 4) Pediments, 5) Shallow Pediments and 6) Buried Pediments.

A number of hill ranges are located in the northern and northeastern parts of the district, whereas the southern, western and eastern parts of the district are gently undulating and dotted with a few isolated hillocks. The important hill ranges in the district are Yercaud hills, Kanjamalai hills, Godumalai hills and Pachamalai hills.

3.2 Soils

The soils can be broadly classified into 6 major soils types viz., Red insitu, Red Colluvial Soil, Black Soil, Brown Soil, Alluvial and Mixed Soil. Major part of the district is covered by Red insitu and Red Colluvial soils. Block soils are mostly seen in Salem, Attur, Omallur and sankari taluks. Brown Soil occupies major portion of Yercaud and parts of Salem and Omallur taluks and the Alluvial Soil is seen along the river courses in Omallur and Sankari taluks. Mixed soil is occurring only in Attur taluk.

4.0 GROUND WATER SCENARIO

4.1 Hydrogeology

Salem district is underlain entirely by Archaean Crystalline formations with Recent alluvial and Colluvial deposits of limited areal extents along the courses of major rivers and foothills respectively. Weathered and fractured crystalline rocks and the Recent Colluvial deposits constitute the important aquifer systems in the district.

Colluvial deposits represent the porous formations in the district. These deposits comprise boulders, cobbles, gravels, sands and silts and are seen in the foothills of all the major hill ranges. The thickness of these aquifers ranges from a few meters to as much as 25 m. Ground water occurs under phreatic conditions and is developed by means of dug wells. They are important from ground water development point of view in the hilly terrain.

Granite Gneiss, Charnockite, Granites and other associates represent the hard consolidated crystalline rocks. Ground water occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fractured zones. These rocks are devoid of primary porosity but are rendered porous and permeable with the development of secondary openings by fracturing and their interconnection. The thickness of weathered zone in the district ranges from <1m to more than 25 m. The

depth of the dug wells tapping weathered residuum ranged from 10 to 38 m bgl.

Dug wells have traditionally been the most common ground water abstraction structures used for irrigation in the district. The yields of the open wells are low in the hill areas about 500 lpm for a drawdown of 2 m for four hours pumping, where as the open wells in the plains varies from 200 to 1000 lpm. The yields of dug wells are improved at favorable locations by construction of extension bores, which are 50 to 75 m. deep. In recent years, the declining water levels and reduction in yields of wells are being observed due to increased extraction of ground water by a large number of bore wells for irrigation purposes. The Specific capacity of large diameter wells tested in crystalline rocks from 59 to 270 lpm / m. of drawdown

The yield of bore wells drilled down to a depth of 40 to 75 m, by various state agencies mainly for domestic purposes ranged from 20 to 500 lpm. The yield of successful bore wells drilled down to a depth of 300 m bgl during the ground water exploration programme of Central Ground Water Board ranged from <1 to 14.00 lps.

The depth to water level in the district varied between 0.10 – 11.46 m bgl during pre-monsoon depth to water level (May 2006) and varied between 0.10 – 17.15 m bgl during post monsoon depth to water level (Jan 2007). The seasonal fluctuation shows a rise in water level, which ranges from 0.20 to 3.25 m bgl. The piezometric head varied between 3.00 to 18.00 m bgl (May 2006) during pre monsoon and 2.02 to 19.62 m bgl during post monsoon.

4.1.1 Long Term Fluctuation (1998-2007)

The long-term water level fluctuation for the period 1998-2007 indicates both rise and fall in water level in the area. The rise was of the order of 0.0155 – 0.1566 m/year, while the fall in water level range from 0.0020 to 0.7940 m/year.

4.1.2 Aquifer Parameters

Aquifer Parameters	Weathered Residuum	Fractured Aquifer
Transmissivity (m ² /day)	<1 - 100	1 -265
Storativity	-	9.6 x 10 ⁻⁵ 4.3 x 10 ⁻²
Specific yield	0.015	-

4.2 Ground Water Resources

The ground water resources have been computed jointly by Central Ground Water Board and State Ground & Surface Water Resources and Development Centre (PWD, WRO, Government of Tamil Nadu) as on 31st March 2004. The salient features of the computations are furnished below.

Stage of Groundwater Development of Salem District as on 31st March 2004 (in Ha.m.)								
S.No		Net Groundwater Availability	Existing Gross Draft for Irrigation	Existing Gross Draft for Domestic and industrial water supply	Existing Gross Draft for all uses	Allocation for Domestic and Industrial Requirement supply up to next 25 years (2029)	Net groundwater Availability for future Irrigation Development	Stage of Groundwater Development
1	Attur-S	7543.47	14523.12	173.52	14696.64	179.84	-7159.49	195
2	Ayotiapattinam	3146.30	5043.20	179.31	5222.51	185.85	-2082.75	166
3	Edapadi	4332.96	2346.91	159.19	2506.10	165.00	1821.06	58
4	Gangavalli	9482.49	20790.98	157.87	20948.85	163.63	-11472.12	221
5	Kadayampatti	4291.40	3932.34	229.21	4161.55	237.57	121.49	97
6	Kolathur-S	3994.43	3063.99	142.72	3206.71	147.93	782.52	80
7	Konganapuram	1504.64	2001.45	126.93	2128.37	131.55	-628.36	141
8	Magudanchavadi	2951.83	3527.06	172.13	3699.19	178.41	-753.64	125
9	Mecheri	2160.74	2259.71	191.75	2451.46	198.74	-297.71	113
10	Nangavalli	1910.71	2065.46	207.24	2272.70	214.80	-369.55	119
11	Omalur	3279.48	5337.48	313.85	5651.33	325.29	-2383.30	172
12	P.N.Palayam	8208.99	16236.20	125.19	16361.39	129.76	-8156.97	199
13	Panamaruthupatti	1994.98	3628.20	132.24	3760.44	137.06	-1770.28	188
14	Salem	3118.60	3506.66	469.67	3976.34	486.80	-874.86	128
15	Sankari	5374.97	3815.88	233.24	4049.12	241.75	1317.34	75
16	Talaivasal	9998.83	20728.50	238.43	20966.93	247.09	-10976.76	210
17	Tharamangalam	2492.66	2027.97	183.96	2211.93	190.67	274.02	89
18	Valapadi	2653.08	3005.01	107.71	3112.72	111.63	-463.56	117
19	Veerapandi	2576.08	5119.34	249.46	5368.80	258.55	-2801.82	208
20	Yercaud	4496.27	0.00	72.53	72.53	75.17	4421.10	2
	District Total	85512.91	122959.45	3866.17	126825.62	4007.12	-41453.65	148

4.3 Ground Water Quality

Ground water in phreatic aquifers in Salem district, is in general colorless, odorless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (in μ S at 25 o C) during May 2006 was in the range of 526 to 6040. In major part of the district the electrical conductivity is above 1000 μ S/cm, except in Yercaud, P.Goundanpalayam & Salem.

Total Hardness is observed in 60% of the samples exceeds more than permissible limit. About 80% of the samples are having high concentration of Nitrate, which may be due to anthropogenic activities. 22% of the samples are having higher concentration of Fluoride (>1.5 mg/L), in parts of Edapadi, Attayampatti & Jalakandapuram. It is observed that the majority of the samples are characterized by higher concentration of NO_3 , SO_4 and F than the BIS permissible limit.

In general, groundwater can be categorized as High Salinity on the basis of SAR and hence proper soil management strategies are to be adopted for major parts of the

4.4 Status of Ground Water Development

The estimation of groundwater resources for the district has shown that out of 20 blocks, 14 blocks are over exploited and 1 block is under “critical” category.

Tamil Nadu Water Supply and Drainage (TWAD) Board is the Government agency responsible for providing drinking water supplies to the urban and rural populace in the district. The water requirements of the habitations are met with either through surface water sources or through various Mini Water Supply Schemes or Integrated water supply schemes utilising the available ground water resources. The status of urban and rural water supply in the district as in March 2007 is furnished below

Total Number of Rural Habitants	:	4501
Not Covered	:	0 (0-9 LPCD)
Partly Covered	:	786 (10-39 LPCD)
Fully Covered	:	3715 (>40 LPCD)

The habitants of the Corporation are provided with 100 LPCD water. The habitants of 3 Municipalities and 34 Town Panchayats of the district are provided with 90 - 112 LPCD and 60 – 112 LPCD water respectively.

5.0 GROUNDWATER MANAGEMENT STRATEGY

5.1 Groundwater Development

In view of the comparatively high level of ground water development in the major part of the district and the quality problems due to geogenic and anthropogenic factors, it is necessary to exercise caution while planning further development of available ground water resources in the district.

The development of ground water for irrigation in the district is mainly through dug wells tapping the weathered residuum or recent alluvial deposits. The yields of dug wells are improved at favourable locations by construction of extension bores, which are 40 to 75 m. Deeper bore wells have also become popular as the source for irrigation in the district in recent years. The map showing the development prospects for the district is shown in Plate VI.

5.2 Water Conservation and Artificial Recharge

CGWB had prepared a master plan to augment groundwater potential by saturating the shallow aquifer taking into consideration the available unsaturated space during post monsoon and available uncommitted surplus run off. Subsequently, computations have been made for Drought Prone Area Programme (DPAP) for over exploited and critical blocks in the districts warranting immediate attention. Institute of Remote Sensing, Anna University had prepared block wise maps demarcating potential zones for artificial recharge for the State of Tamil Nadu. Subsequently, State Government agencies have constructed artificial recharge structures with their own fund or with fund from Central Government, dovetailing various government programmes.

Ministry of Water Resources, Government of India has initiated Dug Well Recharge Scheme in the State. The scheme is being implemented by the Nodal Department (SG&SWRDC, PWD, WRO, Government of Tamil Nadu) with the technical guidance of CGWB. The subsidy of Rs4000/- for small and marginal farmers and Rs2000/- for the other farmers is credited to the beneficiaries' bank account through NABARD. The scheme after implementation will prove to be beneficial to the irrigation sector. The available uncommitted surplus run off has to be recomputed, taking into consideration the quantum of recharge effected through existing irrigation dug wells also. The existing structures and uncommitted surplus flow should be considered for further planning of artificial recharge programme.

On the basis of experimental studies, it has been found that desilting of existing tanks followed by percolation pond with recharge wells, recharge shafts are economical.

There is considerable scope for implementation of roof – top rainwater harvesting in the district. Recharge pits / Shafts / trenches of suitable design are ideal structures for rainwater harvesting in such areas. Central Ground Water Board is also providing free technical guidance for implementation of rooftop rainwater harvesting schemes.

6.0 GROUNDWATER RELATED ISSUES & PROBLEMS

The development of ground water in the district, in general, is high. As many as 14 out of 20 blocks in the district have been categorised as over exploited or critical . The trend analysis of historical ground water level data also indicates a long-term fall in a major part of the district. Based on the factors mentioned, it is inferred that a major part of the district could be considered vulnerable to various environmental impacts of water level depletion such as declining ground water levels, drying up of shallow wells, decrease in yield of bore wells and increased expenditure and power consumption for drawing water from progressively greater depths..

Incidence of fluoride in ground water in excess of permissible limits for drinking has been reported from parts of the district, especially from the fracture zone.

Pollution of ground water due to industrial effluents is another a major problem in the district. A number of industrial units including textile units, sugar mills and sago factories exist in the district, the effluents from which have caused local pollution of surface and ground water resources. Excessive use of fertilisers and pesticides in agriculture has also reportedly resulted in localised enrichment of nitrate in the phreatic zone.

7.0 AWARENESS & TRAINING ACTIVITY

7.1 Mass Awareness Campaign (MAP) & Water Management Training Programme (WMTP) by CGWB

Two Mass Awareness Campaign on “Ground Water Management, Regulation & Conservation” was organized in Salem district. The first Campaign was conducted at Sankari during 1999 – 2000 and the second Campaign was conducted at Gangavalli in 2006-07.

The findings of exploration carried out by CGWB, the results of Geophysical investigations for source finding and their limitations, Ground water resource potential of Salem district, Techniques on Ground water resource management and need for regulation and water conservation were explained to the gathering of 350 and 500 people at Sankari and Gangavalli respectively.

One Water Management Training Programme (WMTP) was organized on “Water Management” at Attur on 8.11.2006 and 9.11.2006. 40 officers attended the training from various State Government agencies, Representatives of Panchayat Administration, Farmers Association, etc.

8.0 AREA NOTIFIED BY CGWA/SGWA

Central Ground Water Authority has notified three blocks for registration of ground water abstraction structures owing to very high ground water development in the blocks as given below.

1. Gangavelli
2. Talaivasal
3. Veerapandi

Government of Tamil Nadu vide G.O.No. 53 has restricted groundwater development for irrigation in the over exploited blocks of Tamil Nadu. The over exploited blocks in this district are as follow.

- | | |
|-------------------|----------------------|
| 1. Attur | 8. Omalur |
| 2. Ayotiapattinam | 9. P.N.Palayam |
| 3. Gangavalli | 10. Panamarathupatti |
| 4. Konganapuram | 11. salem |
| 5. Magudanchavadi | 12. Talaivasal |
| 6. Mecheri | 13. Valapadi |
| 7. Nangavalli | 14. Veerapandi |

9.0 RECOMMENDATIONS

As the development of ground water has already reached an alarming stage in many blocks of this district, further development of ground water for creation of additional irrigation potential has to be carried out with extreme caution.

The heterogeneity of crystalline formation and poor yield prospects make the availability of ground water for further development site specific and scientific methods may employed for siting of wells.

On the basis of experiences in execution of Central Sector Scheme and Demonstrative Projects on artificial recharge, the desilting of existing ponds/tanks will be the most cost effective structures. The provision of recharge wells/shafts in percolation ponds/check dams will enhance the efficiency of these structures.

Rainwater Harvesting has already been made mandatory by the Govt. of Tamil Nadu and people have already made provision for roof top rainwater harvesting. However, efforts may be made to apply corrections if required to make these structures effective. Further, operation and maintenance of artificial recharge structures are essential to make them efficient and priority may be given to this activity so as to make these structures effective. A concerted effort involving various Government agencies and NGOs can create the necessary awareness among the rural masses. Action plan in this direction with participation of state and central agencies and industrial establishments is recommended.

PLATE II

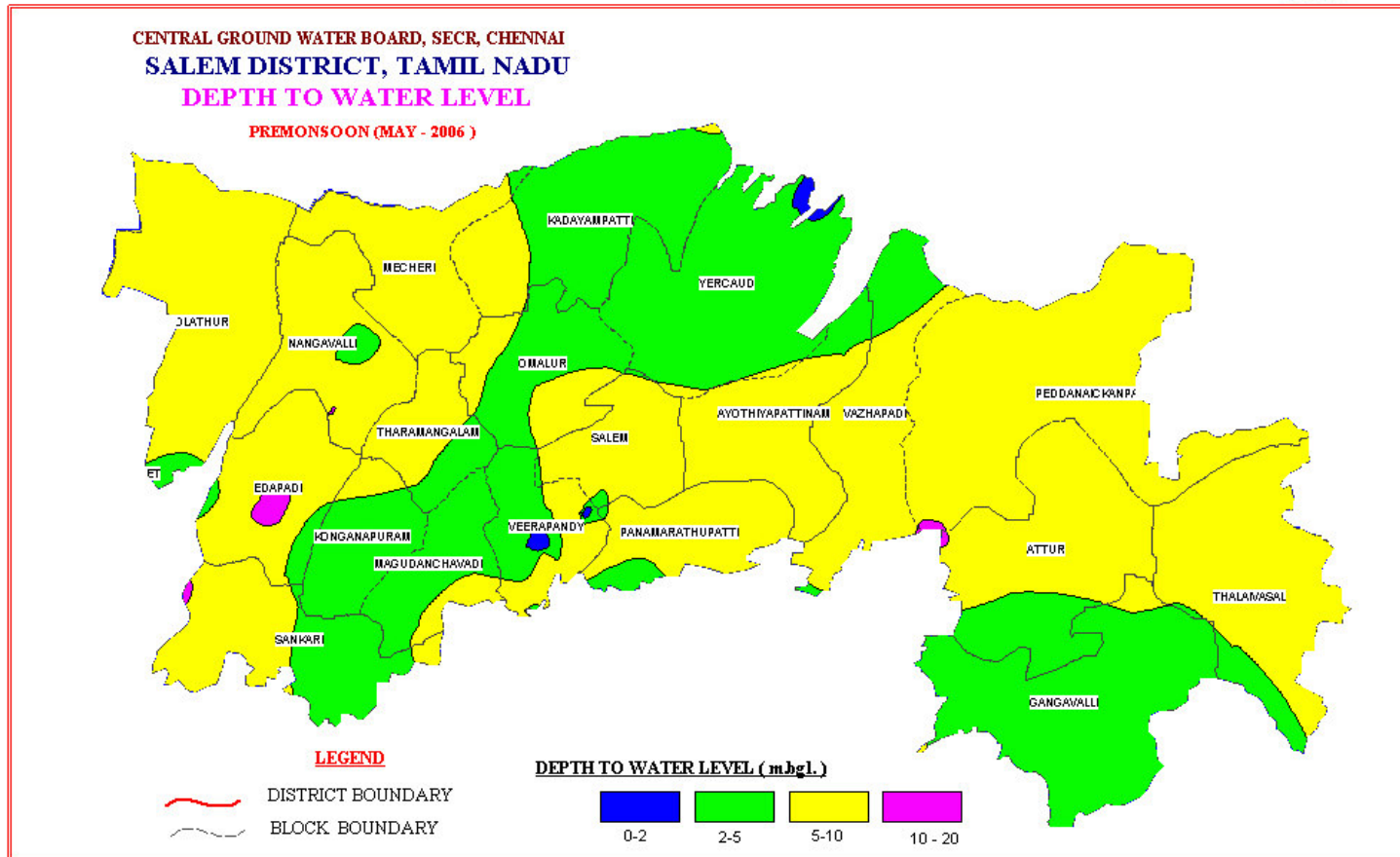


PLATE III

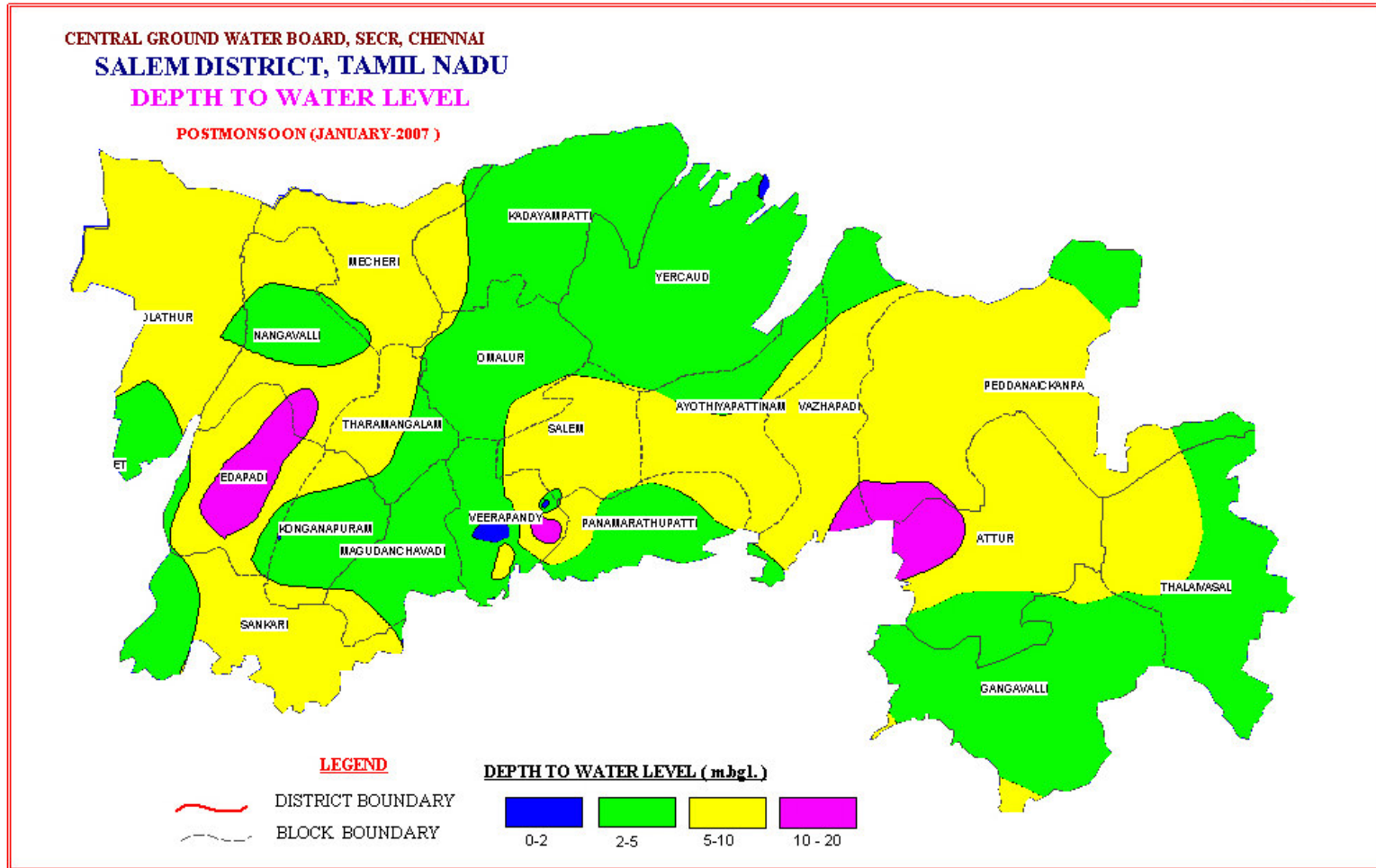


PLATE IV

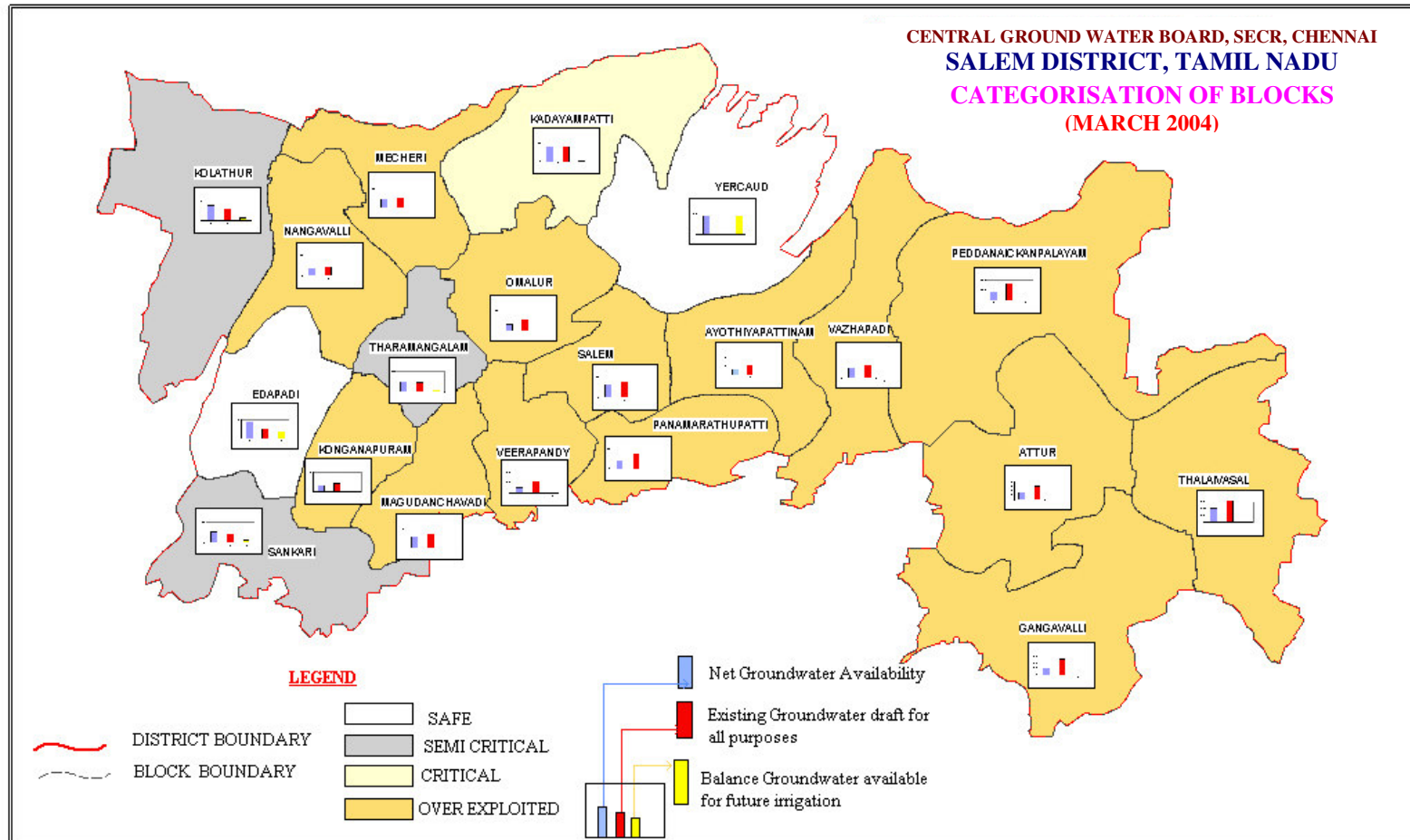
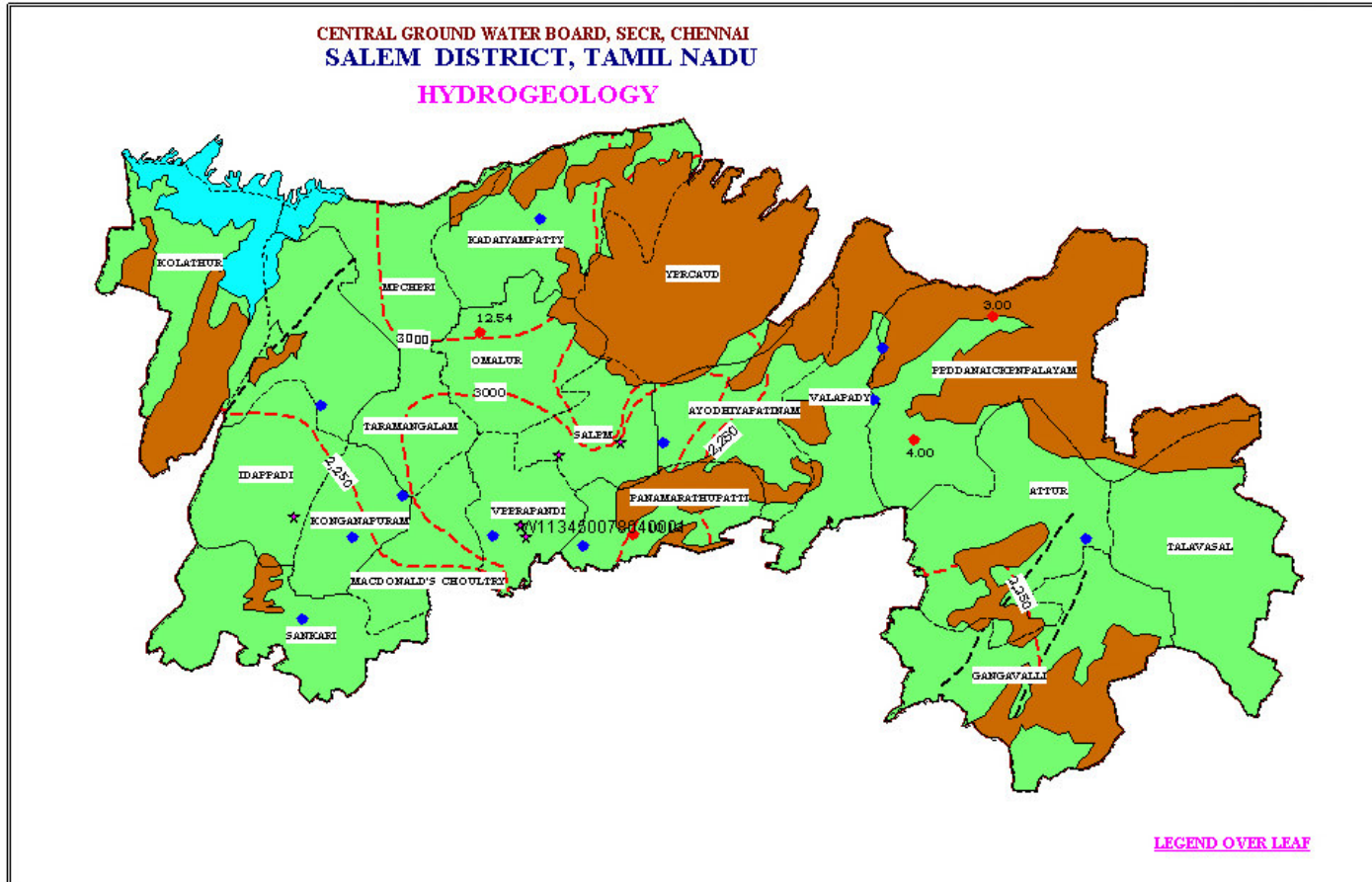







PLATE V






LEGEND FOR PLATE V


ADMINISTRATIVE SETUP

-  DISTRICT BOUNDARY
-  BLOCK BOUNDARY
-  HILLY AREA
-  TRIANGULATION HEIGHT
[elevation in meters]
-  RESERVOIR


GROUND WATER HYDROLOGY

-  EXPLORATORY BORE WELL [CGWB]
-  HIGH YIELDING BORE WELL [CGWB]
-  FLORIDE > 1.5 (mg/l)

HYDROCHEMISTRY

-  ISOCONS [Sp ELECTRICAL CONDUCTANCE [$\mu\text{S}/\text{Cm}$ at 25° C]

STRUCTURE

-  TRACE OF LINEAMENT

AQUIFER

CONSOLIDATED

AGE

ARCHAIC

LITHOLOGY

GRANITES, GNEISSES,
CHARNOCKITE.

**GROUND WATER
CONDITIONS**

DISCONTINUOUS,
UNCONFINED TO
SEMICONFINED
AQUIFERS, RESTRICTED
TO WEATHERED
RESIDUUM
AND FRACTURES

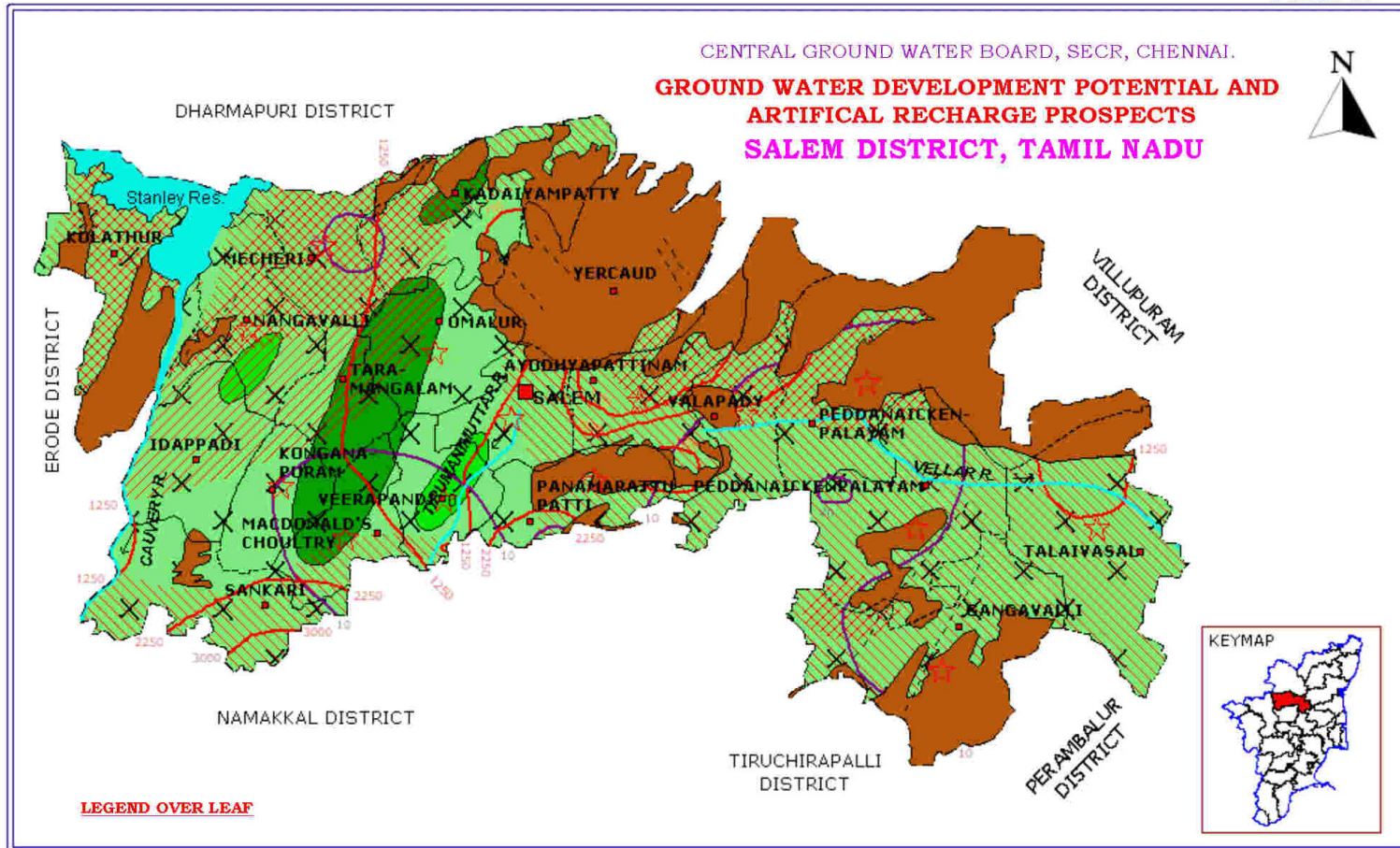
**YIELD
PROSPECTS
(CU.M/D)**

< 50 NEAR
WATERSHED
DIVIDES & HIGH
GROUNDS. 50 - 200
NEAR THIRD ORDER
STREAMS AND LOW
GROUNDS.











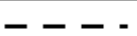



**GROUND WATER
DEVELOPMENT
STRATEGIES**

SUITABLE FOR
DEVELOPMENT
THROUGH DUG
WELLS BOREWELLS
FEASIBLE IN FRACTURE
ZONES, BEST LOCATIONS
BEING INTERSECTION
OF FRACTURES

PLATE VI



LEGEND PLATE FOR VI**DISTRICT – SALEM**

	Wells Feasible	Rigs Suitable	Depth Of Well (M)	Discharge (LPM)	Suitable Artificial Recharge Structures
 Hard Rock Aquifer	Dug Cum Bore Well Bore Well	Manual+ DTH DTH	10 – 20 30 + 70	20 - 100	Check Dams/Recharge Wells/ Gully Plugs
 Hard Rock Aquifer	Dug Cum Bore Well Bore Well	Manual+ DTH DTH	10 – 20 30 – 100	100 – 180	Check Dams/ Percolation Ponds/ Farm Ponds
 Hard Rock Aquifer	Dug Cum Bore Well Bore Well	Manual+ DTH DTH	10 – 15 30 – 100	180 – 300	Check Dams/ Percolation Ponds/ Farm Ponds /Gully Plugs
 	District Boundary District Headquarters		 	Block Boundary Block Headquarters	
	Water Level Pre-Monsoon (Decadal Mean 1993-2002) MbgL			EC In Microsiemens / Cm. At 25° C	
	River			Lineament	
	Fluoride Greater Than Maximum Permissible Limit (1.5mg/L)			Nitrate Greater Than Maximum Permissible Limit (45mg/L)	
	Hilly Area				

OTHER INFORMATION

Geographical Area	5207 Sq.Km.
No. Of Blocks	20
Major Drainage	Caavery
Population (2001)	30,16,346
Average Annual Rainfall	600 - 1600 mm
Annual Range Of Temperature	32 – 45°C
Regional Geology	Hard Rocks: Charnodites, Granites & Gneisses
Net Ground Water Availability For Future Irrigation	Nil
Stage Of Ground Water Development As On January 2003	148%
Names Of Block Showing Intensive Ground Water Development	<p>★ Over-Exploited: Athur, Ayyadipattinam, Gargavalli, Kangarapuram, Mugundhamudi, Mecheri, Nangunalli, Omalur, P.N.Pahyam, Paramurupatti, Salem, Talairasal, Vakpadi & Veerapandi</p> <p>☆ Critical: Kachampatti</p>

SAVE WATER
AND
CONSERVE WATER